UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/717,574	11/21/2003	Jac-Hyeong Kim	1293.1983	9399

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EXAMINER
RODRIGUEZ, GLENDA P

ART UNIT	PAPER NUMBER
2627	

DATE MAILED: 07/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<table>
<tr>
<td rowspan="2">Office Action Summary</td>
<td>Application No.
10/717,574</td>
<td>Applicant(s)
KIM, JAE-HYEONG</td>
</tr>
<tr>
<td>Examiner
Glenda P. Rodriguez</td>
<td>Art Unit
2627</td>
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</table>

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>26 April 2006</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-24</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-24</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____ .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-4, 6-9, 11, 13-16, 18-21, 23 and 24 are rejected under 35 U.S.C. 103(a) as

being unpatentable over Smith et al. (US Patent No. 5, 880, 901).

Regarding Claims 1 and 6, Smith et al. teaches a method for switching heads in a hard

disk drive, the method comprising:

Calculating deviations between a reference head and each of the heads (Col. 20,

L. 50-54 and Col. 12, L. 51-Col. 13, L. 10);

Generating a mapping table, elements of which are deviations between the

reference head and each of the heads, and storing the mapping table in a memory

(Col. 20, L. 50-54 and Col. 12, L. 51-Col. 13, L. 10 and Col. 11, L. 23-29);

Switching a head in operations to a head associated with a track or sector

requested to (Col. 12, L. 51-Col. 13, L. 10, wherein Smith et al. teaches

positioning each head with respect to each physical address, making it obvious to

when accessing a specific physical address, the respective head that belongs to

that address should be used, hence switching the heads if required.);

Applying a deviation of the switched head, which is recorded in the mapping

table, to the virtual track or the sector address of the track or the sector on which

the switched head is positioned, to obtain the physical address or the sector address of the track on which the switched head is positioned (Col. 12, L. 51-Col. 13, L. 10, it is obvious that if the heads have been placed with a respective deviation or offset according to its physical address, then when accessing a specific physical address, the respective head will be applied its respective offset in order to access that physical address.); and

Accessing the track or the sector to be accessed based on the obtained physical track or sector address (Col. 12, L. 51-Col. 13, L. 10).

Claim (11) has limitations similar to those treated in the above rejections, and is met by the references as discussed above. Claim (11) however also recites the following limitations: "positioning heads at arbitrary locations (Col. 12, L. 61-Col. 13, L. 10, wherein they teach placing the head at a calibration area, which is an arbitrary area throughout the disk, wherein the deviations are determined.)."

Claims (23 and 24) have limitations similar to those treated in the above rejections, and are met by the references as discussed above. Claims (23 and 24) however also recites the following limitations: "subtracting a physical address deviation of the reference head from each of the physical address deviations of the heads in order to make the physical address deviation of the reference head substantially zero (Col. 12, L. 59-63) and wherein the reference head is the head having a physical address whose absolute value is the least among read physical addresses of tracks or sectors on which the heads of a head assembly are positioned (Col. 12, L. 59-63)."

Regarding Claim 15, Smith teaches a method of controlling the head switching of a hard disk drive in a system, comprising:

Calculating physical track address by referring to a mapping table stored in a memory (Col. 20, L. 50-54 and Col. 12, L. 39-Col. 13, L. 10 and Col. 11, L. 23-29);

Supplying a control signal to read data from, or write data to a disk (Col. 12, L. 39-56);

Supplying a signal to control motion of the head to a track on the disk (Col. 4, L. 47-60, wherein it teaches the elements that control the motion of the transducers, which has the head assembly coupled thereon.);

And accessing the disk using calculated physical track addresses (Col. 12, L. 39-Col. 13, L. 10).

Regarding Claim 18, Smith et al. teaches a system for controlling switching of heads of a hard disk drive, comprising:

A controller coupled to the heads by a read/write channel and a pre-amplifier (Element 340);

A memory coupled to the controller (Col. 11, L. 25-29);

A host interface coupled to the controller and the read/write channel (It is obvious that a host or user has to be coupled to the controller in order to give instructions to the controller.);

And a voice coil motor driver supplying a driving current to the voice coil and

coupled to the controller (Element 39),

Wherein the controller accesses a disk on the hard disk drive using physical track

addresses read from disks on the hard disk drive and a mapping table stored in the

memory (Col. 12, L. 39-Col. 13, L. 10).

Regarding Claims 2, 7 and 13, Smith et al. teach all the limitations of Claims 1, 6 and 11,

respectively. Smith et al. further teach wherein the reference head is the head having a physical

address whose absolute value is the least among read physical addresses of tracks or sectors on

which the heads of a head assembly are positioned (Col. 12, L. 59-63).

Regarding Claims 3, 8 and 14, Smith et al. teaches all the limitations of Claims 2, 7 and

11, respectively. Smith et al. further teach wherein subtracting a physical address deviation of

the reference head from each of the physical address deviations of the heads in order to make the

physical address deviation of the reference head substantially zero (Col. 12, L. 59-63).

Regarding Claims 4 and 9, Smith et al. teach all the limitations of Claims 1 and 6,

respectively. Smith et al. further teach wherein defining an available data zone (Col. 12, L. 67 to

Col. 13, L. 10).

Regarding Claims 16 and 19, Smith et al. teach all the limitations of Claims 15 and 18,

respectively. Smith et al. further teach wherein calculating physical track addresses includes

obtaining the physical track address of the disk on which a head is positioned to access by

applying a track address deviation of the disk stored in the memory to a virtual track address of

the disk (Col. 12, L. 39-Col. 13, L. 10).

Regarding Claim 20, Smith et al. teaches all the limitationd of Claim 18. Smith et al.

further teach wherein the controller is a digital signal processor, a microprocessor, or a

microcontroller (Element 340).

Regarding Claim 21, Smith et al. teaches all the limitations of Claim 18. Smith et al.

further teach wherein the controller supplies a control signal to the read/write channel to read

data from, or write data to, the disk in the disk drive (Col. 4, L. 49-60).

3. Claims 5, 10 and 22, are rejected under 35 U.S.C. 103(a) as being unpatentable over

Smith et al. in view of Melrose et al. (US Patent No. 6, 975, 468).

Regarding Claims 5 and 10, Smith et al. teaches all the limitations of Claim 4. However,

Smith et al. does not explicitly teach wherein the available data zone ranges from the first track

from the outer boundary of a disk accessed by the reference head to the last track at the inner

boundary of a disk accessed by a head having the greatest physical address deviation. This

limitation is taught by Melrose in Col. 5, L. 33-43, wherein Melrose et al. teaches that it is done

for each zone. It would have been obvious to a person of ordinary skill in the art, at the time the

invention was made, to modify Smith et al.'s invention with the teaching of Melrose in order to

prevent errors when accessing the disk as taught by Melrose et al. in the Summary of the

Invention.

Regarding Claim 22, Smith et al. teach all the limitations of Claim 18. However, Smith

et al. does not explicitly teach wherein the host interface includes a buffer memory and a control

circuit interacting with a computer. This limitation is taught by Melrose et al. in Col. 4, L. 29-

38.

4. Claims 12 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. in view of Ueda et al. (US Patent No. 5, 969, 895).

Regarding Claim 12, Smith et al. teaches all the limitations of Claim 11. However, Smith et al. does not teach wherein the arbitrary locations are over milled areas of corresponding disk surfaces. This limitation is taught by Ueda et al. in Figs. 5 and 8 of Ueda et al. along with its Description. It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify Smith et al.'s invention in order to efficiently switch heads in a disk drive according to the Abstract of Ueda et al.

Regarding Claim 17, Smith et al. teaches all the limitations of Claim 16. However, Smith et al. does not explicitly teach wherein the virtual track address of the disk is the substantially equal to the virtual track address of a reference disk. This limitation is taught by Ueda et al. in Fig. 5, wherein the track deviation of head 0 is substantially equal from the virtual to the physical track.

Response to Arguments

5. Applicant's arguments with respect to claims 1-24 have been considered but are moot in view of the new grounds of rejection.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Albrecht et al. (US Patent No. 7, 046, 476).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Glenda P. Rodriguez whose telephone number is (571) 272-7561. The examiner can normally be reached on Monday thru Thursday: 7:00-5:00; alternate Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on (571) 272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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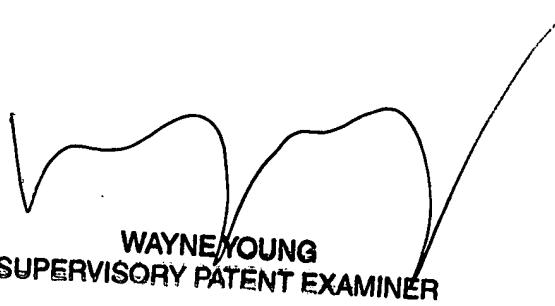
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